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I, JULIE BILLINGSLEY, TEAM LEADER EXAMINATION SUPPORT AND  
SALES hereby certify that annexed is a true copy of the Provisional specification  
in connection with Application No. PS 1868 for a patent by ODYSSEY  
TECHNOLOGY PTY LTD as filed on 22 April 2002.

WITNESS my hand this  
Eighth day of May 2003

*J. Billingsley*

JULIE BILLINGSLEY  
TEAM LEADER EXAMINATION  
SUPPORT AND SALES





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**AUSTRALIA**

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**PATENTS ACT 1990**

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**PROVISIONAL SPECIFICATION**

***FOR THE INVENTION ENTITLED:***

**"OSCILLATING DISC CUTTER WITH SPEED CONTROLLING BEARINGS"**

**The invention is described in the following statement:-**

## OSCILLATING DISC CUTTER WITH SPEED CONTROLLING BEARINGS

This invention relates to an oscillating disc cutter with speed controlling bearings and has been devised particularly though not solely to prevent high speed rotation of a disc cutter when the cutting disc is disengaged from a rock face.

5        Oscillating disc cutters of the type described in international patent specification PCT/AU00/00066 (the contents of which are incorporated herein by way of cross reference) have the general requirement that a mechanism is provided to prevent the cutting disc from rotating at a high speed when the cutter is not engaging the rock face. In international patent specification PCU/AU00/00066, this is achieved by a gear  
10   arrangement shown generally 616 in Figure 7 of that specification.

It should be noted that the reference to international patent specification PCT/AU00/00066 is not an admission that this publication forms part of the common general knowledge in Australia or in any other territory.

It is advantageous to be able to control the free running rotational speed of the disc  
15   cutter, without the complexity of a gear arrangement.

Accordingly the present invention provides an oscillating disc cutter having a cutting disc driven by a drive mechanism within a housing provided with one or more bearings arranged to transmit the axial and radial reaction forces from the cutting disc into the housing, the bearings including a hydrostatic bearing arranged to react the main  
20   axial force into the housing, and an opposed fluid lubricated bearing arranged to react axial force from the hydrostatic bearing, the hydrostatic and fluid lubricated bearings being arranged and operable such that rotational frictional drag in the fluid lubricated bearing increases under axial thrust from the hydrostatic bearing as the axial reaction forces from the cutting disc decrease.

25        Preferably the fluid lubricated bearing is a water lubricated bearing.

Preferably the bearings are arranged and operable such that the increase in frictional drag in the fluid lubricated bearing is sufficient to prevent the cutting disc from rotating at a high speed when the cutter is not engaging the rock face.

Notwithstanding any other forms that may fall within its scope, one preferred form  
5 of the invention will now be described by way of example only with reference to the accompanying drawing which is a cross sectional elevation through an oscillating disc cutter incorporating the present invention.

The oscillating disc cutter shown in the accompanying drawing is generally similar in configuration to that shown in Fig. 7 of international patent specification  
10 PCT/AU00/00066, with like numbers referring to the components in that drawing as described in the description of the international patent specification.

Instead of the bearings 605 and 606 from PCT/AU00/00066 being water lubricated, only bearing 605 in the present invention is water lubricated. Bearing 606 is replaced by a hydrostatic bearing 700 supplied with high pressure oil from an annular  
15 passage 701 inside a demountable ring 702 through which oil is supplied under pressure via a nipple 703. The bearing 700 contains pockets in the normal manner of hydrostatic bearings.

The hydrostatic pressure applied to the bearing 700 causes the disc 603 to be forced against the water lubricated bearing surface 605. This has the effect of  
20 preventing the disc 603, to which the disc cutter 602 is bolted, from rotating at a high speed when the cutter is not engaging the rock face, and accordingly eliminates the need for the gear arrangement 616 referred to in the description of Fig. 7 in international patent specification PCT/AU00/00066.

It will be appreciated that due to the orbital movement of the disc 603, it does continue to rotate at a very slow speed but this is very similar to the speed at which the cutting action on the rock face would cause it to rotate.

Thus, in essence, the water lubricated bearing 605 functions as a frictional drag  
5 brake on the rotation of the disc 603 and hence of the cutter 602.

In this manner, the over speeding of the cutting disc 602 when the disc cutter is removed from the rock face or when the reaction force is significantly decreased, is prevented by the frictional drag in the water lubricated bearing 605 under axial force from the hydrostatic bearing 700.

10 DATED this 22<sup>nd</sup> Day of April 2002

ODYSSEY TECHNOLOGY PTY LTD

Attorney: JOHN D. FORSTER  
Fellow Institute of Patent and Trade Mark Attorneys of Australia  
of BALDWIN SHELSTON WATERS

